AN ECLECTIC HISTORY OF SCIENCE.

Progress of Science. By J. Villin Marmery. Pp. 357. (London: Chapman and Hall, Limited, 1895.)

THE custom of inserting laudatory prefaces or introductions, written by well-known men, in works of science by lesser lights, which was commented upon in these columns a few weeks ago, reaches the ridiculous in the case of this book. A letter from Mr. Samuel Laing to the publishers is printed, in the course of which he says: "I have now had time to read Mr. Marmery's book, and find it a work of great learning and research . . . and I can confidently recommend it as alike interesting and instructive." What induced the publishers to print this purely business letter as a testimonial to the book's good qualities, passes our comprehension. A book usually finds its proper level, and the effort to force it into a higher position by means of a letter of introduction from a more or less distinguished individual, must prove futile; for in literature, scientific or otherwise, authors are judged entirely by their own works.

Every one will recognise that to attempt to condense the history of science into a volume of about three hundred and fifty pages, is to court failure. All that can be accomplished in so small a space is to describe the well-defined steps of advancement along the road of natural knowledge, and to exhibit the continuity of scientific developments. Mr. Marmery has done this with a fair amount of success. After briefly noting the knowledge of the Egyptians and Chaldeans so far back as 3000 B.C., he surveys the successive stages in the history of science, and devotes a few lines to men and matters of first-rate importance in each. His statement of the progress made by the Arabians from the ninth to the fifteenth centuries, brings into view the substantial achievements of a people which then stood in advance of the whole world. Our obligations to the Arabs are indubitable; nevertheless, few European historians have expressed them. "Eminence in science is the highest of honours" was a maxim which represented the bearing of Islam towards scientific knowledge at a period when Europe was ruled by monkish philosophy, and when investigators were stamped as heretics.

The review of the science of the Greek, the Arabian, the Mediæval, and the Revival periods, leads to the science of the Modern period, from the end of the sixteenth century to the present time. And here the author treads upon dangerous ground. He has had, perforce, to create invidious distinctions by selecting from the host of scientific workers those that appear to him to have added most to the store of knowledge. Huxley got over the difficulty in his address on "The Progress of Science," published among his collected essays (vol. i.), by omitting references to all living men, and by dealing only with results. Mr. Marmery might have saved himself from hostile criticism by following the same method; but, in that case, his volume would have wanted the very information which is the chief justification for its existence. His selection of names has, he says, been determined "by what appears *typical originality* in the work, rather than by what is imposing in extent and weight." Here and there we fancy this criterion has not been applied; but in a book covering so wide a scope, such deficiencies may well be excused. Modern investigators are divided into seven groups, viz. (1) biologists, (2) geologists, (3) chemists, (4) mathematicians, (5) astronomers, (6) physicists, (7) eminent practical men. Short accounts of the main achievements of the individual workers in each group are given, and are fairly trustworthy. In an appendix, the names of foremost men of science in all the periods are tabulated, and a copious index makes it easy to find the sketch of the works of any one of them.

Many imperfections the book certainly has, but in spite of them we think it deserves some words of commendation. Those who wish to know something about the evolution of scientific knowledge, and the multitude of readers who like to dip into a book to find what this or that man of science has done, may obtain from this handy volume the information they seek. We could easily enumerate a score of names which ought to find a place in the book, but are wanting. Probably it was because the author was aware of the incompleteness of his record, that he omitted the definite article from the title of his book.

MICROSCOPIC STUDY OF ROCKS.

Petrology for Students: an Introduction to the Study of Rocks under the Microscope. By A. Harker. (Cambridge University Press, 1895.)

THIS latest addition to the Cambridge Science Manuals is intended by the author as a guide to the study of rocks in thin slices under the microscope In scarcely another English text-book on the subject has the treatment of rocks from the purely petrographical point of view of microscopic examination been so strictly adhered to throughout as in the book before us. "Microscope" is almost the first word in the book, and sounds the key-note of the whole.

After a short introduction, containing a few notes on the optical properties of minerals, the author plunges at once into the systematic description of the different rock species. The usual chapters on the characters and methods of separation and determination of the rock-forming minerals are omitted altogether; for all such mineralogical points, the reader is referred to standard works on the subject. The book, therefore, corresponds, though on a much smaller scale, to the second volume of such text-books as those of Rosenbusch and Zirkel.

In the classification of the massive igneous rocks the author divides them into *plutonic*, *intrusive* and *volcanic*, but is careful to point out that the divisions themselves are based upon the *structural* characters resulting from the different conditions of consolidation. This classification resembles that of Rosenbusch, but the author's intrusive groups do not correspond exactly with the Ganggesteine of Rosenbusch, for he extends them to the basic family, whereas even Rosenbusch considered this to be impracticable. In this connection we notice that those much abused terms "diabase" and "porphyrite" receive new definitions. Diabase is in this book used to designate, not pre-Tertiary or altered dolerites, but the group of intrusive basic rocks corresponding to the volcanic basalts, while porphyrite is applied to the intrusive rocks corresponding to the volcanic andesites. The author, of course, follows the British school in admit-

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ting no criterion of geological age in the nomenclature of the rocks.

Throughout the book, each rock group is treated for the most part under the three headings: constituent minerals, structure, illustrative examples. Under the last heading, purely petrographical descriptions are given of typical examples, chosen generally from British rocks.

The sedimentary rocks are treated under the divisions, arenaceous, argillaceous, calcareous, and pyroclastic. In perhaps no other English text-book have the microscopic characters of the sedimentary rocks been so minutely described. The subject of metamorphism is treated under the two heads of thermal metamorphism and dynamic metamorphism, and the effects produced on arenaceous, calcareous, argillaceous and igneous rocks are separately described. The book concludes with a short chapter on various crystalline rocks, including gneisses, granulites, &c. It is, perhaps, almost inevitable, owing to the nature of the subject, that the book should give the general impression of consisting of a series of descriptions of rock-sections; but, be this as it may, there can be nothing but praise for the clear and straightforward way in which the author has presented his facts, and for the wealth of new matter which the book contains. The book shows evidence of most careful research into the literature of the subject, and is in fact thoroughly up to date, containing many extracts from papers which have appeared within the present year. G. T. P.

OUR BOOK SHELF.

Garden Flowers and Plants: a Primer for Amateurs. By J. Wright. With fifty Illustrations. (London: Macmillan and Co., 1895.)

ONE of the great advantages of gardening and of a love of flowers consists in the fact that they may be indulged in by rich and poor alike.

The rich have no monopoly in the beauty of flowers, the poor are not debarred from their enjoyment. The costliest orchid in a ducal garden is not one whit more beautiful than an Iris which may be bought for a few pence. If a slug devour the one it is easily replaced, if such an accident befall the other the loss may be beyond repair. Nor by those who look beneath the surface and seek to penetrate the significance of the diversity of form, and the meaning of the beauty they witness, is costly expenditure needed. The cheapest and commonest afford as copious materials for research and investigation as the dearest plant in the nurseryman's price list. Anything that will lighten the sordid conditions under which so many of the poorer classes live, anything that will brighten their homes and give them an interest in something beyond their daily toil, must be considered as a boon of incalculable value. Such a boon is offered by the pursuit of gardening. In country districts, moreover, where small gardens and allotments can be had, gardening may be made to add considerably to the resources of the family. It may be doubtful whether market-gardening on a large scale will always be profitable, but there can be no doubt that the small plot of the labourer may be turned to good account, provided circumstances are even only moderately favourable. To provide for the needs of small gardeners and amateurs, Mr. Wright has published the little manual before us. The author is an accomplished practitioner, and his experience as a County Council lecturer has enabled him to ascertain precisely what is wanted by his auditory. Mr. Wright begins at the beginning by telling his readers how to make a garden, how to lay down gravel walks, what to grow on walls, what on beds, even what may be cultivated in areas. The principal categories of hardy plants are passed in review, such as annuals, perennials, bulbous plants, bedding plants, and so on, and clear directions are given as to their management from beginning to end. In all this there is not much that needs comment from a reviewer, who can only say that the little primer is well done, and excellently suited for its purpose.

An explanation of the real cause of "damping" off would have been of value, as the most "practical" of gardeners is not desirous of cultivating fungus at the expense of cherished seedlings.

The small illustrations are helpful, and a full index adds materially to the value of the book.

The Time Machine. By H. G. Wells. (London: Wm Heinemann, 1895.)

INGENIOUSLY arguing that time may be regarded as the fourth dimension of which our faculties fail to give us any distinct impression, the author of this admirably-told story has conceived the idea of a machine which shall convey the traveller either backwards or forwards in time. Apart from its merits as a clever piece of imagination, the story is well worth the attention of the scientific reader, for the reason that it is based so far as possible on scientific data, and while not taking it too seriously, it helps one to get a connected idea of the possible results of the ever-continuing processes of evolution. Cosmical evolution, it may be remarked, is in some degree subject to mathematical investigations, and the author appears to be well acquainted with the results which have been obtained in this direction. It is naturally in the domain of social and organic evolution that the imagination finds its greatest scope.

Mounted on a "time-machine" the "time-traveller" does not come to a halt until the year eight hundred and two thousand, and we are then favoured with his personal observations in that distant period. In that "golden age," the constellations had put on new forms, and the sun's heat was greater, perhaps in consequence of the fall of a planet into the sun, in accordance with the theory of tidal evolution. "Horses, cattle, sheep, and dogs had followed the ichthyosaurus into extinction"; but, most remarkable of all, "man had not remained one species, but had differentiated into two distinct animals," an upper-world people of "feeble prettiness," and a most repulsive subterranean race reduced to mere mechanical industry. It is with the time-traveller's adventures among these people, and their relations to each other, that the chief interest of the story, as such, belongs.

Continuing his journey to an age millions of years hence, nearly all traces of life had vanished, the sun glowed only with a dull red heat, tidal evolution had brought the earth to present a constant face to the sun, and the sun itself covered a tenth part of the heavens. These and other phenomena are very graphically described, and from first to last the narrative never lapses into dulness.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Teaching University for London.

I HAVE read with surprise your article on the University of London.

Probably by some accident you had not seen my reply to Lord Kelvin's letter when you went to press. I now enclose a copy, and trust to your fairness to insert it:

"2 *St. James's Square, S.W., July* 9.

"MY DEAR RÜCKER,—I am sorry I could not immediately answer the letter which you have forwarded to me on behalf of

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